

## CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

PROJECT MANAGER			JOB NUMBER (JN)	CONTROL SECTION (CS)
DESCRIPTION IF NO JN/CS				
<b>MDOT PROJECT MANAGER:</b> Check all items to be included in RFP.  WHITE = REQUIRED GRAY SHADING = OPTIONAL  Check the appropriate Tier in the box below			<b>CONSULTANT:</b> Provide only checked items below in proposal.	
<b>TIER I</b> <b>(\$25,000-\$99,999)</b>	<b>TIER II</b> <b>(\$100,000-\$250,000)</b>	<b>TIER III</b> <b>(&gt;\$250,000)</b>		
			Understanding of Service	
			<i>Innovations</i>	
			<i>Safety Program</i>	
N/A			Organization Chart	
			Qualifications of Team	
			Past Performance	
Not required as part of official RFP	Not required as part of official RFP		Quality Assurance/Quality Control	
			Location of Service Personnel <b>(Only check for on-site inspection services)</b>	
N/A	N/A		Presentation	
N/A	N/A		Technical Proposal (if Presentation is required)	
3 pages including cover sheet <b>(No Resumes)</b>	7 pages	19 pages	Total maximum pages for RFP <b>not including key personnel resumes</b>	

**BUREAU OF HIGHWAYS  
REQUEST FOR PROPOSAL  
for  
QUALIFICATIONS BASED SELECTION FOR PREQUALIFIED SERVICES**

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is currently prequalified for this type of work and you are interested in providing services, please indicate your interest by submitting a Proposal. The Proposal must be submitted in accordance with the latest "Consultant Selection Guidelines for Service Contracts", available on the MDOT website.

For efficiency sake, we are asking that the Consultant firm provide 4 paper copies of the Proposal to the MDOT project manager named in the attached scope of services.

These copies must be received by 4:00 p.m. on May 22, 2006. Fax and electronic copies are not acceptable.

In addition, provide one stapled copy to:

Regular Mail:

Secretary, Operations Contract Support  
Michigan Department of Transportation  
P.O. Box 30050  
Lansing, MI 48909

OR

Overnight Mail:

Secretary, Operations Contract Support  
Michigan Department of Transportation  
425 W. Ottawa  
Lansing, MI 48933

This copy is to be received within three working days after the due date and time specified above. Please do not deliver in person.

Any questions relative to the scope of services must be submitted by e-mail to the MDOT project manager. Any questions must be asked at least three working days prior to the due date and time specified above. All questions and their answers will be placed on the MDOT website as soon as possible after receipt of the questions. The names of Consultants submitting questions will not be disclosed.

For a cost plus fixed fee contract, the selected Consultant must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the Consultant's job-order accounting system.

The selection team will review the information submitted and will select the firm considered most qualified to perform the engineering services based on the proposals. The selected Consultant will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

**The maximum allowable pages for the proposal are limited to the selected Tier shown on MDOT Form 5100B, which is posted with this RFP. Page limits apply to the entire proposal. The number of pages per section is the decision of the creator of the proposal. Include in proposal only those items that are checked by the MDOT project manager on form 5100B.**

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

The scope of services is attached to this solicitation.

**Michigan Department of Transportation**

**SCOPE OF SERVICES  
FOR  
DESIGN SERVICES  
IM 80024 83935C**

**FIN CODE: IM**

**CONTROL SECTION: 80024 (39024 Minor)**

**JOB NUMBER: 83935C**

**PROJECT LOCATION:** This project is located on I-94 EB from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo West County Line in Antwerp and Texas Township in Van Buren and Kalamazoo County. The project length is 6.0 miles.

**PLAN COMPLETION DATE: 01/17/2007**

**PREQUALIFICATION:**

**A. Primary Prequalification Classification:**

Roadway Rehabilitation and Rural Freeway Design

**B. Secondary Prequalification Classification:**

Hydraulics  
Maintaining Traffic Plans and Provisions  
Pavement Marking Plans  
Permanent Freeway Traffic Signing Plans  
Road Design Surveys

**DBE REQUIREMENT:** 10%

**MDOT PROJECT MANAGER:**

**Kyle Rudlaff  
Coloma TSC  
3880 Red Arrow Hwy.  
Benton Harbor, MI 49022  
Phone: (269) 849-2347  
email: [rudlaffk@michigan.gov](mailto:rudlaffk@michigan.gov)**

**SCOPE OF SERVICES**  
**CS 80024 - JN 83935C**  
**EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**I. PROJECT DESCRIPTION**

This project has been designed through the Base Plans. Design ceased on I-94 EB in 2005. Design services are sought to complete the design. The intent is to complete this I-94 EB roadway reconstruction design through final plans and produce a similar product as produced for the JN 53350 project. JN 53350 is on WB I-94 from M-51 to Mattawan and is underway throughout the 2006 construction season. The design parameters, the typical sections, and details are expected to be similar to the JN 53350 project under construction in 2006.

A copy of JN 53350 plans, I-94 eastbound plans-in-progress, and existing old plans may be obtained by requesting a CD from Kyle Rudlaff at E-mail address: [rudlaffk@michigan.gov](mailto:rudlaffk@michigan.gov).

**This project consists of all work related to designing this I-94 reconstruction project, including but not limited to the following:**

1. Prepare electronic plan sheets for I-94 reconstruction including plan and profiles, typical cross sections, stage construction details, and any additional special details required for construction. Design profile sheets will be required for this project. Drainage vicinity map, pavement marking plan sheets, and freeway signing plan sheets are to be produced for this project.
2. Design mainline pavement as twelve inch thick non-reinforced concrete pavement over six inches of aggregate base-modified. Existing subbase is to remain in place except at profile lowering locations. Design ramp extensions. Design HMA ramp resurfacing or concrete repairs as directed by the MDOT project manager.
3. Design mainline profile to be generally similar to the existing profile. Introduce profile revisions to obtain minimum vertical clearance for the travel lanes and the first two feet of shoulder from the pavement edges at all structures.
4. Produce a report on the 13 design elements listed in the MDOT Road Design Manual, Chapter 3, Section 3.11.02D.
5. Design all drainage that is impacted by project work according to the MDOT Drainage Manual. Replace all culverts within project limits under EB I-94 that drain the median. Evaluate all remaining culverts that span both bounds of I-94. Create a summary report of all culverts on the project. Include size, material, condition, and design flow. All culverts draining the median shall be a minimum size of 18 inches. Video tape all culverts besides median draining culverts from 1 mile west of 24<sup>th</sup> Street (Mattawan Exit 66) to the POE.

6. Prepare permit information packages including diagrams and calculations for wetland fill areas or impacts to water courses.
7. Plans are to show existing utility information. Perform a utility verification distribution that includes distribution of plans to all utilities listed by the Coloma TSC Utilities/Permit Engineer. The Consultant shall communicate with utility companies through the Coloma TSC Utilities/Permit Engineer, who will coordinate any required relocations.
8. Design maintenance of traffic for the project work. Construct temporary traffic crossovers to shift all I-94 traffic on existing westbound I-94 pavement while I-94 eastbound is reconstructed. Design the removal of all temporary crossovers at the conclusion of the reconstruction work.
9. There is no bridge design work in this project other than possible signing work.
10. Perform design survey to collect data as described in this narrative. Topographic information files are available, and intended to be utilized for this project's plan sheets. A supplemental survey that collects cross sections every 100 feet from the inside edge of pavement through the median to the inside shoulder hinge of WB I-94 and the outside pavement edge to EB ROW line is required in this project to develop earthwork quantities and confirm slope conditions. A lane closure is required to collect inside pavement edge shots. No traffic control is required to collect outside edge of paved shoulder shots provided that work vehicles are parked entirely outside the line of delineators. Traffic control for a shoulder closure is required when work vehicles are parked on the shoulder of I-94 or workers occupy the shoulder pavement.

Location, flow line elevation, size, and material data is to be collected for all culverts and sewers, and the drainage items placed on the plans. Flow line elevations of water courses leaving MDOT ROW must be collected. The east branch of Paw Paw River at B02 of 80024 should have the surface water elevation instead of flow line collected.

Project control has been installed along this project. The consultant will be provided an existing topography file collected in 1998, for areas east of 24<sup>th</sup> Street, benchmarks, and control points. The consultant will be responsible for updating any new or obsolete topographic features by making a visual verification of the topographic information and the site conditions. The Consultant shall make the necessary updates.
11. Roadway outside slopes is to be designed to 1:6 slopes where feasible to do so within MDOT ROW without adverse impacts to drainage, wetlands, or utilities. The Consultant shall produce a report on the design of slopes to be discussed with the MDOT Project Manager. The median slopes are to be designed in consideration of the recent WB I-94 project JN 53350 and a compatible design created for the entire limits of this JN 83935 project. Clearing is to be indicated for all trees and volunteer growth within forty feet of the pavement edge.
12. The Consultant shall evaluate roadside hazards and complete a summary report of the existing and proposed guardrail design to be discussed with the MDOT Project Manager.

13. Soil erosion and sedimentation control design is to be completed by the consultant before the Plan Review Meeting. The JN 53350 SESC design is to be used as a guide. Emphasis is to be put on the fact that this design is the responsibility of the Consultant. Include necessary design hours to revise the design after MDOT comments. Appropriate design symbols and key numbers shall be shown on the profile sheets where possible, or on the construction sheets where appropriate.
14. A geotechnical report will be provided for the Consultant to convert into soil boring sheets. No other geotechnical tasks are anticipated.
15. Design full freeway signing upgrade for I-94 EB and those portions of the Exit 66 interchange associated with EB I-94.
16. Independent pavement marking plans are to be produced for this project.
17. Cost estimates are to be developed at the preliminary plan and OEC plan process steps. Independent cost estimates for design exceptions or other reasons are to be provided as requested by the MDOT Project Manager.
18. The Consultant shall provide a final product in accordance with E-Proposal guidelines. The Consultant shall include every final document in the submission, except those documents that are not available to the Consultant. A paper version of the final submission shall be provided to the MDOT Project Manager at the same time the E-Proposal is provided.
19. Reproduction of one set of 24" x 36" plan review plans and 30 sets of 11" x 17" OEC plans is to be performed by the design consultant. Shipping plan materials to project participants in the OEC distribution is to be performed by the consultant. A list will be provided by the MDOT Project Manager. The MDOT Project Manager will need a set of 11"x17" plans to review before distributions. Reproduction is to be performed for one utility plan distribution with estimated eight 24" x 36" sets of plans shipped to utility companies.
20. Provide project plans, specifications, cross-sections, and all other electronically stored project related documents on a CD along with the paper project submission. Any paper survey materials or reports provided to the design consultant shall be returned to Coloma TSC.

## **II. REQUIRED MDOT GUIDELINES AND STANDARDS**

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Road Design Manual, Standard Plans, Drainage Manual, Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

Consultant is required to use MDOT's current version of Bentley MicroStation for CADD applications and Bentley GEOPAK for road design. Consultant shall comply with all MDOT CADD standards and file naming conventions.

### **III. PROJECT CONSTRUCTION COST**

A. The estimated cost of construction is:

1.	Safety Related Work	\$ 50,000
2.	Base, Surface and Shoulder	\$7,000,000
3.	Geometric Improvements	\$ 150,000
4.	Improve Alignment (Vertical/Horizontal)	\$ 500,000
5.	Drainage Adjustment and Improvement	\$ 300,000
6.	Joint Repair and Pavement Patching	\$ 50,000
9.	Maintaining Traffic	\$1,250,000
10.	Permanent Pavement Markings/Signs	\$ 400,000
11.	Miscellaneous	<u>\$ 600,000</u>
	<b>CONSTRUCTION TOTAL</b>	<b>\$10,300,000</b>

B. The estimated cost of real estate is: \$0

The above construction total is the amount of funding programmed for this project. The Consultant is expected to design the project within the programmed amount.

**If at any time the estimated cost of construction varies by more than 5% of the current programmed amount, then the Consultant will be required to submit a letter to the MDOT Project Manager justifying the changes in the construction cost estimate.**

### **IV. PROJECT SCHEDULE**

The Consultant shall use the following events to prepare the proposed implementation schedule as required in the Guidelines for the Preparation of Responses on Assigned Design Services Contracts. These dates shall be used in preparing the Consultant's Monthly Progress Reports.

<b><u>Target</u></b>		
<b><u>Date</u></b>	<b><u>Task #</u></b>	<b><u>Description</u></b>
10/02/06	3330	Conduct Design Survey
10/17/06	3522	Conduct Hydraulic/Hydrologic Analysis for Storm Water Conveyance
		Submit Environmental Permit Information (3 months prior to the Plan Completion Date)
10/17/06	3540	Develop the Maintaining Traffic Plan
10/17/06	3552	Develop Preliminary Permanent Pavement Marking Plan
10/17/06	3554	Develop Preliminary Freeway Signing Plan
10/17/06	3580	Develop Preliminary Plans
11/17/06		Submit Preliminary Plans
11/17/06	3590	Review Preliminary Plans (Hold The Plan Review Meeting)
01/17/07	3822	Complete Permanent Pavement Marking Plan
01/17/07	3824	Complete Freeway Signing Plan
01/17/07	3830	Complete the Maintaining Traffic Plan
01/17/07	3840	Develop Final Plans and Specifications
12/18/07		Submit Plan/Proposal in-Progress Package to MDOT PM for final review
02/01/07	3870	Hold Omissions/Errors Check (OEC) Meeting
02/01/07		Omissions/Errors Check (OEC) Meeting (approximate date)
02/26/07		Consultant's Plan Completion: Final Construction Plan/Proposal package with recommendations incorporated to MDOT (two weeks after OEC Meeting)
05/10/07		Final Deliverables to MDOT

## **VII. MONTHLY PROGRESS REPORT**

On the first of each month, the Consultant Project Manager shall submit a monthly project progress report to the MDOT Project Manager, Kyle Rudlaff. The monthly progress report shall follow the guidelines in Attachment E.

## **VIII. DELIVERABLES**

The Consultant shall deliver all computer files associated with the project in their native format (spreadsheets, CADD files, GEOPAK files, etc.) on DVD, CD or uploaded to ProjectWise, as directed by the MDOT Project Manager. All CADD/GEOPAK files shall be created and identified with standard MDOT file names as shown in Appendix A of the Road Design Manual.

It is the Consultant's responsibility to obtain up to date MicroStation and GEOPAK seed/configuration files necessary to comply with MDOT's CADD standards which are posted to the bulletin board system. When the use of GEOPAK road design software is necessary to develop plans all pay items shall be placed into the CADD file using GEOPAK's Design and

Computation Manager so that Quantity Manager can be used to transfer pay item information to SAPW/Trns\*port. Any CADD/GEOPAK files that do not conform to MDOT standards will be returned to the Consultant for correction at the Consultant's expense.

Proposal documents shall be submitted in their native format with standard naming conventions as well as combined into one Adobe PDF file in the sequence specified by MDOT. To provide text search capabilities the combined proposal shall be created by converting native electronic files to PDF. Scanning to PDF is discouraged except in instances where it is necessary to capturing a legally signed document or a hard copy version of a document is all that exists.

Plan files shall be submitted in their native dgn format with standard naming conventions as well as plotted into a combined Adobe PDF file. Plan sheets shall be plotted to Adobe PDF with full text search and level on/off capabilities in each full size (24" x 36") and half size (11" x 17") formats. A full size title sheet shall be plotted stamped and signed then scanned for inclusion with the Adobe PDF set. The original title sheet will be sent to the MDOT Project Manager.

Stand Alone Proposal Estimator's Worksheet (SAPW) shall be used to generate the txt and csv files necessary for import into the Trns\*port bid letting software. The SAPW files shall be transmitted electronically by the method specified by the MDOT Project Manager.

The project will require a ratio (scale) of 1":100'. Removal, Construction, and Profile Sheets shall be provided.

Other plan sheets that are required for this project shall be completed by the Consultant. These include, but are not limited to the following plan sheets:

- A. The title sheet. MDOT will provide a map of the area on a disk in our workstation format. If the map is not available, MDOT will provide a map that could be used. The Consultant shall be responsible for any revisions to the title sheet and the title sheet and map shall meet MDOT format and layout guidelines.
- B. Note Sheet.
- C. Typical Cross-Sections.
- D. Project specific Special Details.
- E. Construction staging and traffic control plans.
- F. Detail grade sheets for major intersections, ramp gores and critical areas.
- G. Paving details.

- H. Pavement marking plan(s).
- I. Culvert detail sheet(s).
- J. Vicinity and drainage map sheet.
- K. Alignment sheet.
- L. Witness and benchmark sheet(s).
- M. Soil boring log sheet(s).

All plans, special provisions, estimates, and other project related items shall meet all MDOT requirements and detailing practices (i.e., format, materials, symbols, patterns, and layout) or as otherwise directed by the Project Manager.

All plans, specifications, and other project related items are subject to review and approval by MDOT.

## **IX. UTILITIES**

The Consultant shall be responsible for obtaining and showing on the plans the location and names of all existing utilities within the limits of the project. In the course of resolving utility conflicts, the Consultant shall make modifications to the plans or design details and provide assistance as directed by the MDOT Utility Permits Engineer and/or Project Manager. The Consultant shall attend any utility meetings called to ensure that the concerns are addressed on the plans involving utilities. The Consultant shall assist in the review of utility permit requests to ensure compatibility with the project.

## **X. TRAFFIC CONTROL AND MDOT PERMITS**

The Consultant shall be responsible for all traffic control required to perform the tasks as outlined in this Project Scope of Design Services. See Attachment F. Periods for which lane closures are allowed shall be limited to Monday through Thursday 9:00 a.m. to 3:30 p.m.

The Consultant shall be responsible for obtaining up to date access permits and pertinent information for tasks in MDOT Right of Way (ROW). This information can be obtained through Jarrett Burgess, Utilities/Permits Engineer, at (269) 849-1790.

## **PRE-QUALIFICATION AND SUBCONTRACTING OF CONTRACT WORK**

Any task(s) for which the Primary Consultant is not prequalified must be completed by a Subcontracted Consultant that is prequalified for that task(s). Any questions regarding prequalification should be directed to Phil Brooks, Prequalification Manager, at (517)335-2514.

The Department's prequalification is not a guarantee or warranty of the Subcontracted Consultant's ability to perform or complete the work. The Primary Consultant remains fully responsible to the Department for completion of the work according to the authorization as if no portion of it had been subcontracted.

All Subcontract Consultant communications with the Department shall be through the Primary Consultant to the MDOT Project Manager. This requirement may be waived if a written communication plan is approved by the MDOT Project Manager.

The Department may direct the immediate removal of any Subcontracted Consultant working in violation of this subsection. Any costs or damages incurred are assumed by the Primary Consultant by acceptance of the authorization. It is further understood that the Primary Consultant's responsibilities in the performance of the contract, in case of an approved subcontract, are the same as if the Primary Consultant had conducted the work with their own organization.

## **CONSULTANT RESPONSIBILITIES**

Complete the design of this project including, but not limited to the following:

- A. Meet with the MDOT Project Manager to review project, location of data sources and contact persons, and review relevant MDOT operations. The Consultant shall review and clarify project issues, data needs and availability, and the sequence of events and team meetings that are essential to complete the design by the project plan completion date. Attention shall be given to critical target dates that may require a large lead time, such as geotechnical requirements, ROW submittal dates, Railroad coordination requirements, utility conflict resolution, local agency meetings, etc.
- B. Perform design surveys.
- C. Perform a drainage study and related design.
- D. Prepare required plans, typical cross-sections, details, and specifications required for design and construction.
- E. Compute and verify all plan quantities.

- F. Prepare staging plans and special provisions for maintaining traffic during construction.
- G. Prepare pavement marking plans and special provisions.
- H. Prepare permanent signing plans and special provisions for freeway sign upgrading.
- I. Provide solutions to any unique problems that may arise during the design of this project.
- J. The Consultant may be required to provide Design Services during the construction phase of this project. If Construction Assistance is required, then a separate authorization for those services will be issued.
- K. Maintain a Design Project Record which includes a history of significant events (changes, comments, etc.) which influenced the development of the plans, dates of submittals and receipt of information.

#### **P/PMS TASKS**

- A. **P/PMS TASK 3330 - CONDUCT DESIGN SURVEY**  
Perform surveys as necessary to design this project. The Consultant's survey shall be as complete and accurate as necessary to:
  - 1. Calculate and verify plan quantities to the Consultant's standards.
  - 2. Locate and lay out the future construction of this project.
  - 3. Perpetuate affected property controlling corners for monument preservation.As part of the design proposal, the Consultant shall present a detailed survey work plan for review, evaluation and acceptance by the MDOT Project Manager. A final survey report for review and approval by the MDOT Survey Unit is required. Acceptance of the survey by MDOT Design Survey does not in any way relieve the Consultant of responsibility and liability for the content of the survey. A work plan review with the Region Surveyor is to be arranged before submission. Attachment A contains general instructions for surveys, but no project specific information.
- B. The Consultant shall identify the locations of any water main and/or sanitary sewer on the project.
- C. If water mains and/or sanitary sewers are present within the project limits, the Consultant shall evaluate the necessity for the relocation of water mains and

sanitary sewers, in accordance with Design Division's Informational Memorandum #441B and #402R dated April 13, 1992. The Consultant shall submit a report to Steven J. Urda, Design Engineer - Municipal Utilities, Design Division for review and concurrence. A copy of the report shall be sent to the Project Manager. **If relocation is necessary and water main and/or sanitary sewer work is not part of the Scope of Work, contact the MDOT Project Manager immediately.**

- D. **P/PMS TASK 3522 – CONDUCT HYDRAULIC/HYDROLOGIC ANALYSIS FOR STORM WATER CONVEYANCE**  
See Combined Manual Attachment G for details.
- E. **P/PMS TASK 3540 - DEVELOP THE MAINTAINING TRAFFIC PLAN**  
See Combined Manual Attachment G for details.
- F. **P/PMS TASK 3552 - DEVELOP PRELIMINARY PERMANENT PAVEMENT MARKING PLAN**  
See Combined Manual Attachment G for details.
- G. **P/PMS TASK 3554 - DEVELOP PRELIMINARY FREEWAY SIGNING PLAN**  
See Combined Manual Attachment G for details.
- H. **P/PMS TASK 3580 - DEVELOP PRELIMINARY PLANS**  
See Combined Manual Attachment G for details.
- I. **P/PMS TASK 3590 - REVIEW PRELIMINARY PLANS (THE PLAN REVIEW)**  
See Combined Manual Attachment G for details.
- J. **P/PMS TASK 3822 - COMPLETE PERMANENT PAVEMENT MARKING PLAN**  
See Combined Manual Attachment G for details.
- K. **P/PMS TASK 3824 - COMPLETE FREEWAY SIGNING PLAN**  
See Combined Manual Attachment G for details.
- L. **P/PMS TASK 3830 - COMPLETE THE MAINTAINING TRAFFIC PLAN**  
See Combined Manual Attachment G for details.
- M. **P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS**  
See Combined Manual Attachment G for details.

- N. **P/PMS TASK 3870 - HOLD OMISSIONS/ERRORS CHECK (OEC) MEETING**  
See Combined Manual Attachment G for details.  
The interval for plotting cross-sections and developing the grade book shall be 100 feet. The intervals for critical areas shall be 50 feet.
- O. **P/PMS TASK 5010 - CONSTRUCTION PHASE ENGINEERING AND ASSISTANCE**  
The Consultant may be required to provide Design Services during the construction phase of this project. If Construction Assistance is required, then a separate authorization for those services will be issued.
- P. If excavation is required, submit the excavation locations which may contain contamination. Project Manager then can proceed in requesting a Preliminary Project Assessment (PPA).
- Q. The Consultant shall be required to prepare and submit a CPM network for the construction of this project. See Attachment C for details
- R. The Consultant representative shall record and submit type-written minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees. MDOT will provide and distribute official meeting minutes for the Base Plan Review Meeting (if meeting necessary) and The Plan Review Meeting.
- S. Attend information meetings (i.e., public hearings, open houses, etc.) with the public and public officials to assist in responding to concerns and questions. May require the preparation of displays such as maps, marked-up plans, etc.
- T. Prepare and submit electronically (native format or Adobe PDF) any information, calculations, hydraulic studies, or drawings required by MDOT for acquiring any permit (ie. NPDES, DEQ, etc), approvals (ie. county drain commission) and related mitigation. MDOT will submit permit requests.
- U. Attend any project-related meetings as directed by the MDOT Project Manager.
- V. The Consultant shall assist in the review of driveway and utility permit requests, incorporate the information in the design plans, and respond within 2 weeks from receipt of the permit.
- W. The MDOT Project Manager shall be the official MDOT contact person for the Consultant **and shall be made aware of all communications regarding this**

**project.** The Consultant must either address or send a copy of all correspondence to the MDOT Project Manager. This includes all Subcontractor correspondence and verbal contact records.

- X. The Consultant shall contact the MDOT Project Manager whenever discoveries or design alternatives have the potential to require changes in the scope, limits, quantities, costs, or right-of-way of the project.

### **XIII. MDOT RESPONSIBILITIES**

- A. Schedule and/or conduct the following:
  - 1. Project related meetings.
  - 2. The Plan Review
  - 3. Utility Meetings.
  - 4. Quantity summary sheets and final item cost estimates.
  - 5. Packaging of plans and proposal.
- B. Furnish Special Details and pertinent reference materials.
- C. Furnish prints of an example of a similar project and old plans of the area, if available.
- D. Supply information on existing pavement structure as necessary.
- E. Coordinate any necessary utility relocations.
- F. Furnish pavement core information (Consultant shall place information on plan sheets).
- G. Furnish soil boring information as necessary (Consultant shall place information on plan sheets).
- H. Pavement design.
- I. Furnish FTP site for software download and instructions for the MDOT Stand Alone Proposal Estimator's Worksheet (SAPW).

### **XIV. CONSULTANT PAYMENT**

All invoices/bills for services must be directed to the Department and follow the 'then current' guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's Bulletin Board System. This document contains instructions and forms that must be followed and used for invoicing/billing; payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for Services rendered shall not exceed the "Cost Plus Fixed Fee Not to Exceed Maximum Amount" unless an increase is approved in accordance with the contract with the Consultant. All invoices/bills must be submitted within 14 calendar days of the last date of services being performed for that invoice.

Direct expenses will not be paid in excess of that allowed by the Department for its own employees. Supporting documentation must be submitted, with the invoice/bill, for all billable expenses on the Project. The only hours that will be considered allowable charges for this contract are those that are directly attributable to the activities of this Project. Hours spent in administrative, clerical, or accounting roles for billing and support, are not considered allowable hours; there will be no reimbursement for these hours.

Overtime hours are not to be charged on this project.

**ATTACHMENT A  
SCOPE OF SERVICES  
CS 80024 - JN 83935C  
EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**SURVEY SCOPE OF WORK**

**NOTES:** The Consultant surveyor shall discuss the scope of this survey with the Consultant design engineer before initiating any work on this project. A detailed Survey Work Plan with an estimate of hours by specific survey task such as traversing, leveling, mapping, etc. **must** be included in the project proposal.

It is the responsibility of the Professional Surveyor to safeguard all corners of the United States Public Land Survey System, published Geodetic Control and any other Property Controlling corners that may be in danger of being destroyed by the proposed construction project.

**GENERAL REQUIREMENTS:**

1. Surveys must comply with **all Michigan law** relative to land surveying.
2. Surveys must be done under the **direct supervision** of a Professional Surveyor licensed to practice in the State of Michigan.
3. Work in any of the following categories of survey: Road Design, Bridge, Hydraulic, Right-of-Way, Ground Control (Photogrammetric), and/or Geodetic control, must be completed by a survey firm which is pre-qualified by MDOT.
4. Surveys must meet all requirements of the Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated April 1, 1998. Please contact the Design Survey office to clarify any specific questions regarding these standards.
5. Consultants must obtain all necessary permits, including an up-to-date permit from the MDOT Utilities Coordination and Permits Section, required to perform this survey on any public and/or private property.
6. The Consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job.

7. Consultants are responsible for a comprehensive and conscientious research of all records, including MDOT records, essential for the completion of this project.
8. Measurements, stationing, recorded data, and computations must be in English units, unless specified otherwise by the Project Manager.
9. Coordinate values shall be based upon the Michigan State Plane coordinate system NAD83. This requirement *may* be waived if GPS is not available. If terrestrial traverse methods are employed, and NGS control is not available within 4 miles, a local project coordinate control system may be accepted. All elevations must be based upon the North American Vertical Datum of 1988 (NAVD88) if control is available within 4 miles. If not, existing MDOT plan datum is acceptable. Other datums must be approved by the MDOT Design Division, Supervising Land Surveyor. A preliminary submittal of the adjusted Horizontal and Vertical control for the project may be submitted to the Survey Consultant Project Manager for review and acceptance as soon as it is available.
10. The survey notes must be submitted to the Design Survey Unit in 10" (254 mm) by 12" (305 mm) divided portfolios with flap covers. As many portfolios should be used as needed to contain all of the required documents and diskettes
11. Each portfolio must be labeled on the outside as in the following example:

Survey Notes for:

Route, Location and Project Limits [I-94 under Beaubien Street]  
Control Section [S06-82024] Job Number [45197D] Date [ *of submittal* ]  
By [ *Name of Firm* ]  
Michigan Professional Surveyor [ ] License # [ ]

12. Each submittal is to be divided into five sections. These sections are to be labeled as follows: **Administrative, Alignment, Control, Property, and Miscellaneous.**
  - a. The administrative section will include the following items: a completed copy of the MDOT Form 222(3/99) entitled SURVEY NOTES: RECEIPT AND TRANSMITTAL; the limits of the survey and original survey scope as determined by the Consultant Surveyor and Design Engineer; a complete synopsis of the survey **that shall include, but not be limited to** horizontal and vertical control datums used, methodology, a complete discussion of government corners recovered, perpetuated or otherwise used as part of the survey, problems encountered, and a statement of certification from the Consultant surveyor supervising the project as to compliance with Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated April 1,

1998, as well as documentation of all project specific meetings and /or conversations with MDOT Survey personnel.

- b. The Alignment section will contain a sketch of the alignment, witnesses and stationing of alignment points set or found; an explanation of how the alignment was determined, whether best fit or legal, and all supporting documentation.
  - c. The Control section contains the data collected and a copy of all research documents used to establish the horizontal and vertical reference systems for the project, and includes a thorough written explanation describing how the systems were established. This section should also contain a complete list of control coordinates, control traverse raw data, least squares analysis for both traverse and benchmarks, a separate listing of control point coordinates and witnesses for mapping and construction staking of the project. A complete Benchmark list with datum, station and offset, elevation, and description of each benchmark shall also be included. This information must be submitted in hardcopy and ASCII electronic file format on 3.5" HD diskettes. Also, a sketch of the control traverse, showing any ties (government corners, property, alignment, etc.) shall be included in this section.
  - d. The Property section contains all information that is utilized regarding the real property affected by the project, and all necessary property ties. This may include copies of all **recorded** land corner recordation certificates for the government corners used or reestablished, recorded plats, recorded certified surveys, tax maps, tax descriptions, and adjacent/riparian owners.
  - e. The Miscellaneous section contains any information not included in the previous sections. The surveyor's project report should specify any items included in this section.
13. A portfolio may contain several types of data but, no section is to contain more than a single type (i.e., Bridge surveys separate from Road surveys and Hydraulic surveys). All sheets in a portfolio must be marked with the control section, job number, portfolio section name and page number. Diskettes must be labeled with the control section, job number, data type and file names.
14. The Consultant representative shall record and submit typewritten minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees.
15. The MDOT Project Manager is the official contact for the Consultant. The Consultant must either address, or send a copy of all correspondence to the MDOT Project Manager. The MDOT Project Manager shall be made aware of all communications regarding this

project. Any survey related questions, in regard to this project, should be directed to a Survey Consultant Coordinator.

At the completion of this survey and prior to beginning the design of this project, all field survey notes, all electronic data, and all research records obtained for this project will be considered the property of MDOT and **must be sent to** the MDOT, Design Division, Supervising Land Surveyor, P.O. Box 30050, Lansing, MI 48909. Please use MDOT's Form 222(3/99) entitled SURVEY NOTES: RECEIPT AND TRANSMITTAL for all transmittals. A copy of this transmittal form must also be sent to the Project Manager. It is highly recommended that the project's survey portfolios be submitted for review as soon as possible.

## **FIELD SURVEY**

The purpose of the field survey is to obtain all information and data required by the project design engineer, to leave control in the field for future construction staking, and to provide a sufficient history of the area to enable the MDOT Design Survey Unit to perform dependable surveys in the future. The Consultant surveyor must discuss the scope of this survey with the project design engineer before initiating any work on this project. Notes of this meeting and a detailed Survey Work Plan with an estimate of hours broken down by specific survey task must be submitted to the Project Manager and Consultant Coordinator within two weeks of this meeting.

The Consultant surveyor must contact the County Remonumentation Representative prior to beginning work on the project to inform him of proposed corner perpetuation activities, and to obtain information pertinent to PLSS corners and/or property controlling corners affected by project construction.

## **FINAL REPORT: DELIVERABLES**

The final report for this project shall include the following:

1. In the first pocket of the first portfolio, MDOT's Form 222(3/99) entitled SURVEY NOTES: RECEIPT AND TRANSMITTAL, and the project's Professional Surveyor's Report on company letterhead consisting of the following:
  - a. A comprehensive report, written and signed by the project's Professional Surveyor, of the work performed on this project.
  - b. The source and the methods used to establish the project horizontal coordinates, elevations, and the alignment(s) for this project.

- c. A detailed explanation of anything discovered during the survey of this project that may create a problem for the designer or another surveyor.
- 2. Coordinate and witness lists for the horizontal alignment ties, government corners, traverse control points, and bench marks.
- 3. A sketch of the alignment with reference points and angle of crossing (if appropriate), horizontal coordinates, curve data, and a station equation to existing stationing in feet.
- 4. Least squares analysis for horizontal and vertical control.
- 5. Documentation of horizontal and vertical datum sources.
- 6. Control sketch with control points, government corners and alignment plotted.
- 7. All field survey notes, all electronic survey data files, all calculation sketches, and all research records obtained for this project. All electronic survey data files shall be submitted on 3.5" HD diskettes only, specifically labeled. No paper copy of raw survey data is required.
- 8. Legible copies of all **recorded** Land Corner Recordation Certificates (with Liber and Page number) filed or used for the performance of this survey, and for any PLSS corners, including Property Controlling Corners, which may be disturbed by construction.
- 9. It is the responsibility of the Consultant to insure that all electronic files submitted to MDOT conform to the required format and all documents are legible.
- 10. The Consultant must organize and label the various sections of the portfolios as required by the MDOT Design Surveys *Standards of Practice* dated April 1, 1998.
- 11. It is not necessary to submit mapping data in the survey portfolio for a Consultant survey/Consultant design in the same authorization.

**ATTACHMENT B  
SCOPE OF SERVICES  
CS 80024 - JN 83935C**

**EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**SCOPE OF WORK FOR DRAINAGE STUDY**

The Consultant is to conduct a site investigation of the drainage within the limits of the project. The purpose of this study is to determine where hydraulic analyses and/or surveys are required. If further hydraulic analyses and/or surveys are required, then MDOT will issue a separate authorization for those services.

**Work Steps:**

1. Prepare a typed report summarizing the drainage affected by the project. For each culvert carrying natural drainage within the MDOT Right-of-Way, provide the following information:
  - a. Stream name
  - b. Exact location of the culvert, including Section, Town, Range, and Township
  - c. Size, type, and condition of culvert
  - d. Any evidence of scour or erosion
  - e. Any evidence that the structure is undersized
  - f. Any county drains
  - g. Photographs of the upstream face, downstream face, looking upstream, and looking downstream, as well as any drainage structures, buildings, or farmland that may affect or be affected by the culvert
  - h. Drainage area, including delineation on a USGS quadrangle map (or local contour map, if more up-to-date)
  - i. Type of work proposed, including existing and proposed lengths
2. The report must include any other effects on the drainage; for example, a raise in road grade or widening.
3. Submit the drainage study to the MDOT Project Manager for review and approval by the Design Engineer - Hydraulics/Hydrology.
4. Receive any items returned by the MDOT Project Manager as incomplete or deficient.
5. Make necessary changes and resubmit the incomplete items, including a written response to all comments.

**ATTACHMENT C  
SCOPE OF SERVICES  
CS 80024 - JN 83935C  
EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**CONSTRUCTION CRITICAL PATH NETWORKS**

**I. INTRODUCTION**

The Consultant is required to submit a Construction Critical Path Network at various points in the design process. Refer to the following:

P/PMS TASK 3580 - DEVELOP PRELIMINARY PLANS

P/PMS TASK 3830 - COMPLETE THE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS

Construction Critical Path Networks are often needed to develop the progress schedule for a project. They are required on any project designated to include an Incentive/Disincentive or Special Liquidated Damages clause. Construction Critical Path Networks are also recommended for projects with the following characteristics:

1. New construction.
2. Major reconstruction or rehabilitation on an existing roadway that will severely disrupt traffic.
3. Unique or experimental work.
4. More than one construction season.
5. Complex staging (multiple stages with traffic shifts).

As noted in MDOT's Construction and Technology Instructional Memorandum 1997-7, Progress Schedule Determinations/Critical Path Rates,

*preparation of a Critical Path is a requirement on all Consultant-designed projects, regardless of the project type or complexity*

The MDOT Resident Engineer assigned to the project should be consulted when developing Construction Critical Path Networks.

MDOT requires the precedence diagramming method. The Consultant will submit this network in MPX version 4.0.

## **II. NETWORK DEVELOPMENT**

The network will be defined using the following steps.

1. Activity definition.
2. Activity sequencing.
3. Duration estimation.
4. Schedule development.

### **1. ACTIVITY DEFINITION**

The Consultant will define the specific activities in enough detail so that the proper objectives will be met. The Consultant must identify assumptions (those factors considered true, real or certain). Supporting detail for the activities should be documented and organized as needed to simplify the review of the activities by MDOT personnel.

The Construction Critical Path Network must start with the **Letting Date** as the first activity and terminate with the **End of Project** as the finish activity.

A sufficient number of activities will be required with sufficient detail so that the controlling construction operation(s) may be identified. Notation on each activity shall include a brief work description and activity time duration.

### **2. ACTIVITY SEQUENCING**

Activity sequencing involves identifying and documenting interactivity dependencies. The Consultant must sequence activities accurately to support later development of a realistic and achievable construction schedule. Two types of dependencies should be considered. Mandatory dependencies are inherent in the nature of the work being done, such as construction sequencing. Discretionary dependencies are based on a knowledge of the work to be done. Constraints are used to show how the activities relate to each. The Consultant must include documentation supporting all discretionary dependencies used in the project. All activities must lead to another activity. Only Start to Start, Finish to Finish and Finish to Start relationships will be allowed. All logic shall show how the given activity is dependent on its preceding activities.

### **3. DURATION ESTIMATION**

After the Consultant has sequenced the activities, the Consultant should determine the activity duration. Activity duration estimating involves assessing the number of work periods likely to be needed to accomplish each activity. Duration (working days): No

activity will have a duration greater than 20 working days unless approved by the Engineer. Activities that will be allowed to exceed 20 working days include, but are not limited to, working drawing approvals or other activities not under the control of the Contractor. If requested by the Engineer, the Consultant shall explain the reasonableness of activity time durations. The approved MDOT production rates will be used in estimating activity duration. These are available in the Supplemental Information section of this attachment. The Consultant must document and submit all assumptions made during the duration estimation to MDOT.

#### **4. SCHEDULE DEVELOPMENT**

The activity sequencing, duration estimations and the calendars are combined to create the construction schedule. During the development of the schedule the Consultant will verify:

1. The required schedule to build the project.
2. The constructability of the project.
3. If the maintaining traffic scheme will work.
4. If seasonal limitations will affect the construction.
5. Any other project specific considerations.

The MDOT Calendars will be used by the Consultant in developing the network. The calendars are based on a 4, 5 or 6 day work week. The MDOT Calendars are included in the Supplemental Information section of this attachment.

At this point there should be no negative float in the network. If there is, there is an error in the network and the error must be corrected before network submittal.

All summary tasks shall be removed prior to submittal to MDOT Project Manager

### **III. DELIVERABLES**

After this final step the design Consultant will submit the finished CPM schedule to MDOT

#### **1. Documents**

- A. **11" x 17" PDF plot of the network.** The critical path shall be clearly identified on the plot. A larger plot may be required for complex networks.
- B. Work Day / Completion Date Determination Worksheet.
- C. List of any other assumptions or controlling factors used in creating the network. For example, permit or maintaining traffic restrictions.

## 2. Electronic Format

This section sets the requirements for the electronic submittal of the Consultant's Construction Network. All networks shall be submitted on a 3.5 inch floppy disk (or via E-mail) using one of the following formats:

- A. **Standard Electronic Media Format:** This is a standard ASCII text file containing the data elements below, in the order specified. This file can be created using any text editor or word processing application ( i.e., MS-Word, WordPerfect, Notepad, Write) but must be saved as an ASCII file.

The **first line** will provide a descriptive header describing the submittal and containing:

Control Section  
Job Number  
Route  
Consultant name  
Date of Submittal

The next line will be **blank**, followed by multiple data lines.

Each **data line** will contain one record pertaining to one task of the job. Separate data fields by a comma. Fields within each task line are as follows:

(Note that the term "task" is synonymous with "activity." Leave fields that are not required blank)

- (1) Task # (Job # followed by a hyphen followed by this task's unique 4 digit task number. This is the Preceding Event Activity Code)
- (2) Description of Task, Milestone or Hammock, blank if this record is a constraint
- (3) Calendar (see attached list)
- (4) Duration of task, blank for constraints
- (5) Task # of the next task (Succeeding Event) - leave blank if this record is not a constraint or hammock
- (6) Type of constraint (FS, SS, FF) - leave blank if this record is not a constraint.
- (7) Delay, if required
- (8) Original "Baseline" Start Date
- (9) Original "Baseline" Finish Date
- (10) Current (forecast) Start Date (early start)
- (11) Current (forecast) Finish Date (early finish)
- (12) Estimated completion date (if different from early start + current duration)

- (13) Late Start Date
- (14) Late Finish Date
- (15) Actual Start Date
- (16) Actual Finish Date

Example - each line contains the following:

Task # (preceding event), Description, Calendar, Duration, Next Task # (succeeding event), Constraint Type, Delay, Baseline Start, Baseline Finish, Early Start, Early Finish, Estimated Completion Date, Late Start, Late Finish, Actual Start, Actual Finish, Total Float.

- B. **Primavera Project Planner(P3) 2.0 Export Procedure:** Users who have Primavera Project Planner(P3) version 2.0 can automatically create an export file by following the export procedure below. **Users having an older version of Primavera may use the applications export feature only if they are able to include all the data elements listed in the version 2.0 format.**

1. Choose Tools, Project Utilities, **EXPORT**
2. Click **ADD**, then click **OK** to accept the next sequential ID number, or type a unique number to identify the specifications and click **OK**
3. Enter a description for the specification in the Title field
4. Specify data items to export

#### **Activities**

- Select **Contents of List**

- Use the Description column to specify which data items to export
- To add items, click the right mouse button in the Description column and choose from the list. Suggested Items include: **Activity ID, Activity Description, Actual Start, Actual Finish, Calendar ID, Early Start, Early Finish, Late Start, Late Finish, Original Duration.**
- Select **All Current, All Target, or All Target2**
- Set Description Length to 48

**OR**

#### **Constraints**

- Select **Successor relationships** - Choose this option to export Activity IDs and their corresponding successors only. Lags and relationship types will also be displayed in this output file.

5. Click **FORMAT** in Export Dialog Box

6. In the Output file section, enter a new name and path (ex. A:\actexp or A:\conexp). Do not include a file extension.
7. In the type field, click the minimize button and choose the [**PRN**] - **ASCII** file format for the output file.
8. Select **CALENDAR** for Date Format
9. Set ASCII Output Field Separation to **1** and Blank column width to **0**
10. Click **RUN**
11. In the Output Options dialog box, click on **OK**

**NOTE: A COMPLETED FILE EXPORT WILL CONSIST OF 2 EXPORT FILES (ACTIVITIES & CONSTRAINTS)**

- C. **Microsoft Project Export Procedure:** Users of Microsoft Project Version 4.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the Save File as Type box Select **MPX 4.0**
3. On the drive box select a: or whichever drive is the 3.5" Floppy drive
4. Click on **OK**

This saves the file in MPX format.

- D. **Primavera Sure Track:** Users of Sure Track Version 2.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the filename box input a filename
3. In the Save File as Type box Select **MPX**
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**

This saves the file in MPX format

- E. **Scitor Project Scheduler 7 Export Procedure:** Users of Scitor Project Scheduler Version 7 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In filename box select a filename
3. In the Save File as Type box Select **MPX**
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**

This saves the file in MPX format

- F. **Export Files with Other Scheduling Applications:** Most scheduling packages have export functions similar to those described above. If the Consultant chooses to use packages with export capabilities, they shall include all items listed in the Standard Media Format in a text or ASCII type file.

#### **IV. SUPPLEMENTAL INFORMATION**

##### **A. MDOT CRITICAL PATH-CONSTRUCTION TIME ESTIMATES**

###### **Drainage**

###### **Cross Culverts**

Rural Highways	44 yd./day
Expressways	55 yd./day
Large Headwalls	5 days/unit
Slab or Box Culverts	5 days/pour
Plowed in Edge Drain (production type project)	4921 yd./day
Open Graded Underdrain (production type project)	1312 yd./day

###### **Sewers**

0m-5m(up to 60 in. (1500mm))	44 yd./day
0m-5m(over 60 in. (1500mm))	27 yd./day
5m-over(up to 60 in. (1500mm))	27 yd./day
5m-over(over 60 in. (1500mm))	22 yd./day
Jacked-in-place	14 yd./day
including excavation pit & set up	min. 5 days
Tunnels	
hand mining	9 yd./day
machine mining	22 yd./day
including excavation pit & set up	min. 5 days

Manholes 3 units/day

Catch Basin 4 units/day

###### **Utilities**

Water Main(up to 16 in. (400mm))	109 yd./day
Flushing, Testing & Chlorination	4 days
Water Main(20 in. (500mm) – 40 in. (1050mm))	27 yd./day
Flushing, Testing & Chlorination	5 days
Order & Deliver 24 in. (600 mm) HP Water Main	50 days/order
Gas Lines	109 yd./day

###### **Earthwork and Grading**

###### **Metro Exp**

###### **Rural**

Embankment(CIP)	1962 yd. <sup>3</sup> /day	6932 yd. <sup>3</sup> /day
Excavation and/or Embankment(Freeway)	1962 yd. <sup>3</sup> /day	12033 yd. <sup>3</sup> /day
Excavation and/or Embankment(Reconstruction)	981 yd. <sup>3</sup> /day	4970 yd. <sup>3</sup> /day
Embankment(Lightweight Fill)	392 yd. <sup>3</sup> /day	785 yd. <sup>3</sup> /day
Muck(Excavated Waste & Backfill)	1962 yd. <sup>3</sup> /day	
Excavation(Widening)	656 yd./day	
Grading(G & DS)	820 yd./day	
Subbase and Selected Subbase(up to 8 yd. (7.4m))	656 yd./day	
Subbase and Selected Subbase(8 yd. (7.4 m) & over)	492 yd./day	
Subgrade Undercut & Backfill	1962 yd. <sup>3</sup> /day	
Subbase & Open-Graded Drainage Course	492 yd./day	

### **Surfacing**

Concrete Pavement (8 ft. (7.3m))	492 yd./day
Including Forming & Curing	min. 7 days
Bituminous Pavement (8 ft. (7.3m))	1312 yd./day/course
Concrete Ramps(5.6 yd. (4.9m))	328 yd./day
Including Forming & Curing	min. 7 days
Curb(1 side)	820 yd./day
Concrete Shoulder-Median	1435 yd. <sup>2</sup> /day
Bituminous Shoulders(1 side per course)	820 yd./day
Sidewalk	215 yd. <sup>2</sup> /day
Sidewalk(Patching)	78 yd. <sup>2</sup> /day

### **Structures**

Sheeting(Shallow)	33 yd./day
General Excavation at Bridge Site	981 yd. <sup>3</sup> /day
Excavation for Substructure(Footings)	1 unit/day
Piles(12m)	15 piles/day
Substructure(Piers & Abutments)	5 days/unit

### **Order and Delivery of Beams**

Plate Girders	100-120 days/order
Rolled Beams	90-120 days/order
Concrete Beams	50 days/order
Erection of Structural Steel	3 days/span
Bridge Decks	
Form & Place Reinforcement(66 yd. (60m) Structure)	15 days
Pour Deck Slab(1 1/5 days/pour)	2 days/span
Cure	14 days
2 Course Bridge Decks	
Add 9 days for Second Course Latex	
Add 12 days for Second Course Low Slump	
Sidewalks and Railings	
Sidewalks and Parapets	5 days/span
Slip Formed Barriers	2 days/span
Clean Up	10 days
Pedestrian Fencing	
Shop Plan Approval & Fabrication	1-2 months
Erection	1 week/bridge
Rip Rap Placement	
Bucket Dumped	504 yd. <sup>3</sup> /day
Bucket Dumped and Hand Finished	171 - 684 yd. <sup>3</sup> /day
<b>Retaining Walls</b>	1 Panel/day min. 10 days
<b>Railroad Structures</b>	
Grade Temporary Runaround	981 yd. <sup>3</sup> /day
Ballast, Ties & Track	55 yd./day
Place Deck Plates	5 days/span
Waterproof, Shotcrete & Mastic	5 days/span
<b>Railroad Crossing Reconstruction</b>	10-15 work days
(depends on whether concrete base is involved)	
<b>Temporary Railroad Structures</b>	

Order & Deliver Steel	55 days/order
Erect Steel	1 day/span
Ties and Track	3 days/span

### **Pumphouse**

Structure	30 days/structure
Order & Deliver Electrical & Mechanical Equipment	90 days
Install Electrical & Mechanical Equipment	30 days

### **Miscellaneous**

Removing Old Pavement	66 yd./day
Removing Old Pavement for Recycling(8 yd. (7.3m))	492 yd./day
Crushing Old Concrete for 6A or OGDC	1485 tons/day
Removing Trees(Urban)	15 units/day
Removing Trees(Rural)	30 units/day
Removing Concrete Pavement	538 yd. <sup>2</sup> /day
Removing Sidewalk	299 yd. <sup>2</sup> /day
Removing Curb & Gutter	492 yd./day
Removing Bituminous Surface	1914 yd. <sup>2</sup> /day
Conditioning Aggregate	984 yd./day
Bituminous Base Stabilizing	2990 yd. <sup>2</sup> /day
Ditching	656 yd./day
Trenching for Shoulders	820 yd./day
Station Grading	667 yd./day
Clearing	9568 yd. <sup>2</sup> /day
Restoration(Topsoil, Seeding, Fertilizer & Mulch)	1973 yd. <sup>2</sup> /day
Sodding	2512 yd. <sup>2</sup> /day
Seeding	47840 yd. <sup>2</sup> /day
Guard Rail	252 yd./day
Fence(Woven Wire)	394 yd./day
Fence(Chain Link)	164 yd./day
Clean Up	656 yd./day

Concrete Median Barrier	328 yd./day
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Cure	min. 7 days
Reroute Traffic(Add 4 days if 1st item)	1 day/move
Concrete Glare Screen	492 yd./day
Light Foundations	6 units/day
Order & Delivery	6-8 week/order
Remove Railing & Replace with Barrier(1 or 2 decks at a time)	4 days/side
Longitudinal Joint Repair	1750 yd./day
Crack Sealing	5249 yd./day
Joint and Crack Sealing	547 yd./day
Repairing Pavement Joints - Detail 7 or 8	219 yd./day
Seal Coat	6999 lane yd./day
Diamond Grinding/Profile Texturing Concrete	3947 yd. <sup>2</sup> /day
Rest Area Building	
Order Material	3 months
Construct Building	9 months
Tower Lights	
Order and Deliver Towers	100 days
Weigh-In-Motion	
Order and Deliver Materials	1 month- 6weeks
O & D with Installation	3 months
Raised Pavement Markers	300 each/day
Attenuators	2 each/day
Shoulder Corrugations, Ground or Cut	5 - 6 mi./side/day
Aggregate Base	3468 yd. <sup>2</sup> /day
Aggregate Shoulders	458 yd. <sup>3</sup> /day
Freeway Signing - 3# Post Type	50 signs/day
<b>Concrete Joint Repair</b> (High Production- Projects with > 1000 patches)	
Average(2 yd. (1.8m))	50 patches/day
Large(>2 yd. (1.8m))	598 yd. <sup>2</sup> /day
<b>Bridge Painting</b>	108 yd. <sup>2</sup> /day
<b>Pin and Hanger Replacement</b>	3 beams/day

Order Pin & Hanger

60 days

**Bridge Repair**

Scarifying(Including Clean up)	11960 yd. <sup>2</sup> /day
Joint Removal(Including Clean up)	4 yd./day
Forming & Placement	3.8 yd./day
Hydro-Demolishing	328 yd./day
Barrier Removal	16 yd./day
Placement	49 yd./day
Hand Chipping (Other than Deck)	0.31 yd. <sup>3</sup> /person/day
Shoulder Corrugations, Ground or Cut	5 - 6 mi./side/day
Casting Latex Overlay	273 yd./day
Curing Overlay	
Regular	4 days
High Early	1 day
Thrie Beam Retrofit	33 yd./day
Beam End Repairs	
Welded Repairs	.75 days/repair
Bolted Repairs	.50 days/repair
Bolted Stiffeners (Pair)	.25 days/repair
Grind Beam Ends	.25 days/repair
Welded Stiffeners (Pair)	.25 days/repair
H-Pedestal Repairs:	
Welded Repair	.50 days/each
Replacement	1 day/each
Deck Removal	281 yd. <sup>2</sup> /day

**Surfacing-Bituminous**

Metro-Primary(<(19800 tons (18000mtons))	
Paving	594 tons/day
Joints	164 yd./day
Cold Milling	4066 yd. <sup>2</sup> /day
Aggregate Shoulders	990 tons/day
Metro Primary(>(19800 tons (18000mtons))	
Paving	594 tons/day
Joints	219 yd./day

Cold Milling	8970 yd. <sup>2</sup> /day
Metro Interstate(>(19800 tons (18000mtons))	
Paving	1210 tons/day
Joints	394 yd./day
Aggregate Shoulders	990 tons/day
Urban Primary(<(19800 tons (18000mtons))	
Paving	704 tons/day
Joints	109 yd./day
Cold Milling	2033 yd. <sup>2</sup> /day
Rubbleizing	2033 yd. <sup>2</sup> /day
Aggregate Shoulders	495 tons/day
Urban Primary(>(19800 tons (18000mtons))	
Paving	1100 tons/day
Joints	131 yd./day
Cold Milling	2033 yd. <sup>2</sup> /day
Aggregate Shoulders	550 tons/day
Urban Interstate(>(19800 tons (18000mtons))	
Paving	1320 tons/day
Joints	241 yd./day
Cold Milling	2033 yd. <sup>2</sup> /day
Rubbleizing	6937 yd. <sup>2</sup> /day
Aggregate Shoulders	704 tons/day
Rural Primary(<(19800 tons (18000mtons))	
Paving	704 tons/day
Joints	131 yd./day
Cold Milling	649 tons/day
Crush & Shape	11960 yd. <sup>2</sup> /day
Aggregate Shoulders	704 tons/day
Rural Primary(>(19800 tons (18000mtons))	
Paving	1210 tons/day
Joints	164 yd./day
Cold Milling	880 tons/day
Crush & Shape	11960 yd. <sup>2</sup> /day
Rural Interstate(>(19800 tons (18000mtons))	
Paving	1329 tons/day
Joints	214 yd./day

## B. WORKSHEET

### WORK DAY/COMPLETION DATE DETERMINATION

CS: JN:

DESCRIPTION OF WORK: \_\_\_\_\_

MAJOR WORK ITEM	PRODUCTION QUANTITY	RATE	ESTIMATED TIME
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This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.

TOTAL ESTIMATED TIME:

COMPLETION DATE: \_\_\_\_\_ (Calendar Days or Work Days)

COMMENTS:

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## C. MDOT CALENDARS

The following are the MDOT 4, 5 and 6 day calendars:

CALENDAR	DESCRIPTION	START	FINISH
1	Std - Apr 16 - Nov 15 - 4 day	APR 16	NOV 15
2	LP - Bit Stab - 4 day	MAY 15	OCT 15
3	UP - Bit Stab - 4 day	JUN 01	OCT 01
4	LP S of M-46 - Bit Pave - 4 day	MAY 05	NOV 15
5	LP N of M-46 - Bit Pave - 4 day	MAY 15	NOV 01
6	UP - Bit Pave - 4 day	JUN 01	OCT 15
7	LP - Bit Seal Coat - 4 day	JUN 01	SEP 15
8	UP - Bit Seal Coat - 4 day	JUN 15	SEP 01
9	Tree Planting - Deciduous - 4 day	MAR 01 OCT 01	MAY 15 NOV 15
10	Tree Planting - Evergreen - 4 day	MAR 01	JUN 01
11	South LP - Restoration - 4 day	MAY 01	OCT 10
12	North LP - Restoration - 4 day	MAY 01	OCT 01
13	UP - Restoration - 4 day	MAY 01	SEP 20
14	Full Year - Winter Work - 4 day	JAN 01	DEC 31
21	Std - Apr 16 - Nov 15 - 5 day	APR 16	NOV 15
22	LP - Bit Stab - 5 day	MAY 15	OCT 15
23	UP - Bit Stab - 5 day	JUN 01	OCT 01
24	LP S of M-46 - Bit Pave - 5 day	MAY 05	NOV 15
25	LP N of M-46 - Bit Pave - 5 day	MAY 15	NOV 01
26	UP - Bit Pave - 5 day	JUN 01	OCT 15
27	LP - Bit Seal Coat - 5 day	JUN 01	SEP 15
28	UP - Bit Seal Coat - 5 day	JUN 15	SEP 01
29	Tree Planting - Deciduous - 5 day	MAR 01 OCT 01	MAY 01 NOV 15

30	Tree Planting - Evergreen - 5 day	MAR 01	JUN 01
31	South LP - Restoration - 5 day	MAY 01	OCT 10
32	North LP - Restoration - 5 day	MAY 01	OCT 01
33	UP - Restoration - 5 day	MAY 01	SEP 20
34	Full Year - Winter Work - 5 day	JAN 01	DEC 31
35	Full Year - Expedited - 6 day	JAN 01	DEC 31

**ATTACHMENT D  
SCOPE OF SERVICES  
CS 80024 - JN 83935C**

**EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**VIDEO PHOTOGRAPHY SCOPE OF WORK**

NOTES: The Consultant shall discuss the scope of this video photography with the MDOT Project Manager before initiating any work on this project. A detailed Work Plan with estimate of hours **must** be included in the project proposal. This scope of work shall be part of **P/PMS TASK 3360**.

**Location: One mile west of 24<sup>th</sup> Street to 0.6 miles east of Kalamazoo County Line.**

**GENERAL CONDITIONS AND SPECIFICATIONS FOR VIDEO RECORDING  
STORM SEWERS:**

1. All storm sewers affected by construction along the location (as stated above) will be video recorded.
2. Video recordings shall be performed during minimal storm water flow periods in order to maximize picture quality. The television camera and lighting shall be specifically designed for storm sewer inspection and recording. All video recordings shall be in VHS color.
3. The Consultant or contractor shall provide labor, equipment, and material to clean each storm sewer necessary in order to video record a clear, precise picture of the storm sewer conditions. For the disposal of the waste generated from the cleaning refer to Supplemental Specification 403(1). The labor, equipment, and materials necessary for the cleaning shall be include removal, transportation, and disposal of the debris at no extra cost. **The Department shall not be held liable for the loss or damage to any of the contractor's labor, equipment, or materials.**
4. The camera shall be moved through the line, in either direction, at a rate no greater than 30-feet (9.144-meters) per minute. Stopping may be necessary to properly document the sewer's condition. Winches, TV Cable, rewind, and other devices must not obstruct the camera view or interfere with proper documentation. If during the inspection, the camera will not pass through an entire section, the contractor shall set up his equipment to enter from the opposite opening. If again, the camera fails to pass through, the inspection shall

be considered complete. The camera shall be capable of rotating from side to side to provide views of joint openings

5. All traffic control and traffic control devices to videotape shall be provided by the Consultant or its contractor.
6. The contractor shall observe good housekeeping practices at all times during his operations at no extra cost.
7. In the event hazardous materials become an issue; testing and disposal fees will be negotiated separated to this agreement.

### **FINAL DELIVERABLES**

The Consultant shall provide the Department **three (3)** copies of the video recording and written reports. Measurements of the total sewer length and locations of noted sewer defects shall be recorded on the video tape **and** on the written report describing the findings. **The Consultant shall include in the written report recommendations of storm sewer areas that need to be reconstructed. Based on these findings, MDOT will determine at which location storm sewers will be reconstructed.**

**Video on CD and reports will be submitted to the MDOT Project Manager by September 22, 2006. The tapes shall be edited and have audio production. Once submitted, title to the tape recordings shall become the property of the Department.**

The video report shall be made on a CD with software compatible with Windows Media Player.

**ATTACHMENT E  
SCOPE OF SERVICES  
CS 80024 - JN 83935C  
EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**MONTHLY PROGRESS REPORTS**

The first two pages of this attachment are the necessary layout of the Monthly progress reports and the last three pages are a completed example.

**Control Section 00000  
Job Number 00000C  
Structure Number S00  
Date 00/00/00**

**MONTHLY PROGRESS REPORT**

- A. Work accomplished during the previous month.
- B. Anticipated work items for the upcoming month.
- C. Real or anticipated problems on the project.
- D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.
- E. Items needed from MDOT.
- F. Copy of Verbal Contact Records for the period (attached).

**Structure Number - Control Section - Job Number**  
**Route, Location Description**  
Design Schedule as of 00/00/00

**LIST TASKS, SUBMITTALS, APPROVALS AND MEETINGS AS OUTLINED IN  
SCOPE OF DESIGN SERVICES AS NEEDED. THIS LIST IS JUST AN EXAMPLE.**

Original Authorized Start Date	Original Authorized Finish Date	(Anticipated) or <b>Actual</b> Start Dates	(Anticipated) or <b>Actual</b> Finish Dates	Task	Task Description
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	G	Initial project meeting.
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	3330	Conduct Design Survey
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	3360	Prepare Base Plans
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>		Submit Base Plans
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	3580	Develop Preliminary Plans
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	3390	Develop Construction Zone Traffic Control Concepts
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	3540	Develop Construction Zone Traffic Control Plan
00/00/00	(00/00/00)	00/00/00	<b>00/00/00</b>	3550	Develop Preliminary Traffic Operations Plan
00/00/00	(00/00/00)	00/00/00	<b>00/00/00</b>	3351	Review & Submit of Preliminary Right-Of-Way Plans
00/00/00	(00/00/00)	00/00/00	<b>00/00/00</b>		Submittal of The Plan Review Package
00/00/00	(00/00/00)	00/00/00	<b>00/00/00</b>		Completion of the Plan Review Meeting
00/00/00	(00/00/00)	00/00/00	<b>00/00/00</b>	3840	Develop Final Plans and Specifications
00/00/00	(00/00/00)	00/00/00	<b>00/00/00</b>		Submittal of final plans/proposal package to MDOT for final review.
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>	3870	Omissions/Errors Check (OEC) Meeting
00/00/00	<b>00/00/00</b>	00/00/00	<b>00/00/00</b>		Consultant's Plan Completion: Final Construction Plan/Proposal package with recommendations incorporated to MDOT (two weeks after OEC Meeting)

00/00/00

00/00/00

00/00/00

00/00/00

Final Deliverables to MDOT

## *SAMPLE*

**Control Section 12345**

**Job Number 11111C**

**Structure Number S02**

**Date 07/31/95**

### **MONTHLY PROGRESS REPORT**

- A. Work accomplished during the previous month.
  - 1. During the last month we completed the Final Right of Way plans and submitted them to Thomas Nelson, Jr. on 05/01/99.
- B. Anticipated work items for the upcoming month.
  - 1. Submit the Preliminary Plans and related material on 03/11/99.
  - 2. Attend the meeting regarding the Ameritech lines on the bridge, scheduled for 03/12/99.
- C. Real or anticipated problems on the project.
  - 1. We foresee no problems at this time.
- D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.
  - 1. The design is falling behind schedule because we had problems resolving the geometries of the ramps in relation to the bridge. The Preliminary Plan submittal will be the only task affected by this delay because we will make up the lost time prior to submitting the Final Plans and Specifications.
- E. Items needed from MDOT.
  - 1. Prior to final Plan submittal we will need the latest Special provision and Supplemental Specification checklist.
- F. Copy of Verbal Contact Records for the period (attached).

1. Discussed bridge and ramp geometries with Tom Myers of MDOT Traffic and Safety Division on 07-24-95.

**SN: S02 - CS: 12345 - JN: 1111C**  
**M-111, from There Village Limits to north of That Road**  
Design Schedule as of 07/31/95

Original Authorized Start Date	Original Authorized Finish Date	(Anticipated) or <b>Actual</b> Start Dates	(Anticipated) or <b>Actual</b> Finish Dates	Task	Task Description
01/12/95	01/12/95	<b>01/12/95</b>	<b>01/12/95</b>	G	Initial project meeting.
01/29/95	01/29/95	<b>01/30/95</b>	<b>01/30/95</b>	3330	Conduct Design Survey.
02/17/95	04/10/95	<b>02/17/95</b>	<b>04/20/95</b>	3360	Prepare Base Plans.
02/29/95	02/29/95	<b>02/29/95</b>	<b>02/29/95</b>	3390	Develop the Construction Zone Traffic Control Concepts
03/12/95	03/13/95	<b>03/12/95</b>	(03/30/95)	3540	Develop Construction Zone Traffic Control Plan
03/20/95	03/19/95	<b>03/25/95</b>	(03/30/95)	3551	Develop/Review Preliminary Traffic Signal Plan
07/01/95	07/01/95	(07/01/95)	(07/01/95)	3590	The Plan Review Meeting
07/11/95	08/11/95	(07/11/95)	(08/11/95)	3821	Complete/Review Traffic Signal Plan
09/15/95	09/15/95	(09/15/95)	(09/15/95)	3830	Complete Construction Zone Traffic Control Plan.
09/16/95	09/16/95	(09/16/95)	(09/16/95)	3840	Develop Final Plans and Specifications
09/25/95	09/23/95	(09/25/95)	(09/25/95)	3870	Omissions/Errors Check (OEC) Meeting

## VERBAL CONTACT RECORD

**Control Section** 12345

**Job Number** 11111C

**Structure Number** S02

**Date** 07/31/95

Joe Engineer talked to Tom Myers and decided to use a 0.05'/ft super on ramp A leading into the bridge.

**ATTACHMENT F**  
**SCOPE OF SERVICES**  
**CS 80024 - JN 83935C**  
**EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

Workzone Traffic Control

1. The consultant shall obtain an MDOT Permit prior to operating within MDOT ROW.
2. Prior written notice of activity within MDOT ROW shall be provided to the Coloma TSC Utilities/Permit Engineer as indicated on the permit.
3. The project manager shall be provided a schedule and contact information for Consultant staff operating in MDOT ROW in advance of the activity.
4. The consultant shall discuss work zone traffic control with the Coloma TSC Traffic Engineer prior to the implementation of the work zone. The attached traffic control sequences are to be used for consultant activity that occupies any portion of a traffic lane or the shoulder, including survey activity, or parking of work vehicles.
5. Consultant operated vehicles or equipment shall not be stored overnight within 40 feet of the pavement edge.

### MINIMUM MERGING TAPER LENGTH "L" (FEET )

OFFSET FEET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA )										
	25	30	35	40	45	50	55	60	65	70	
1	10	15	20	27	45	50	55	60	65	70	TAPER LENGTH "L" IN FEET
2	21	30	41	53	90	100	110	120	130	140	
3	31	45	61	80	135	150	165	180	195	210	
4	42	60	82	107	180	200	220	240	260	280	
5	52	75	102	133	225	250	275	300	325	350	
6	63	90	123	160	270	300	330	360	390	420	
7	73	105	143	187	315	350	385	420	455	490	
8	83	120	163	213	360	400	440	480	520	560	
9	94	135	184	240	405	450	495	540	585	630	
10	104	150	204	267	450	500	550	600	650	700	
11	115	165	225	293	495	550	605	660	715	770	
12	125	180	245	320	540	600	660	720	780	840	
13	135	195	266	347	585	650	715	780	845	910	
14	146	210	286	374	630	700	770	840	910	980	
15	157	225	307	400	675	750	825	900	975	1050	

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

"L" =  $\frac{W \times S^2}{60}$  WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = S x W WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER

S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA

W = WIDTH OF OFFSET

#### TYPES OF TAPERS

##### UPSTREAM TAPERS

MERGING TAPER  
SHIFTING TAPER  
SHOULDER TAPER  
TWO-WAY TRAFFIC TAPER

##### DOWNSTREAM TAPERS

(USE IS OPTIONAL)

#### TAPER LENGTH

L - MINIMUM  
1/2 L - MINIMUM  
1/3 L - MINIMUM  
100 ' - MAXIMUM  
100 ' - MINIMUM  
(PER LANE)



#### TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf  
CHECKED BY: BMM

FEBRUARY 2006  
PLAN DATE:

M000e

SHEET  
1 OF 2

FILE: K:\DGN\TSR\STDS\ENGLISH\MNTTRF\M000e.dgn

REV. 01/30/2006

CS: 01

H:\0 SELECTIONS\FY 06 SELECTIONS\06 MAY\MDOT\_RFP\_DESIGN\_SW\_COLOMATSC\_83935C.DOC

# DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D"

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
D (FEET)	250	300	350	400	450	500	550	600	650	700

# GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE<sup>1</sup> "B"

SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

\* POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

1 BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS (A POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS), AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.



## TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf

FEBRUARY 2006

M000e

SHEET

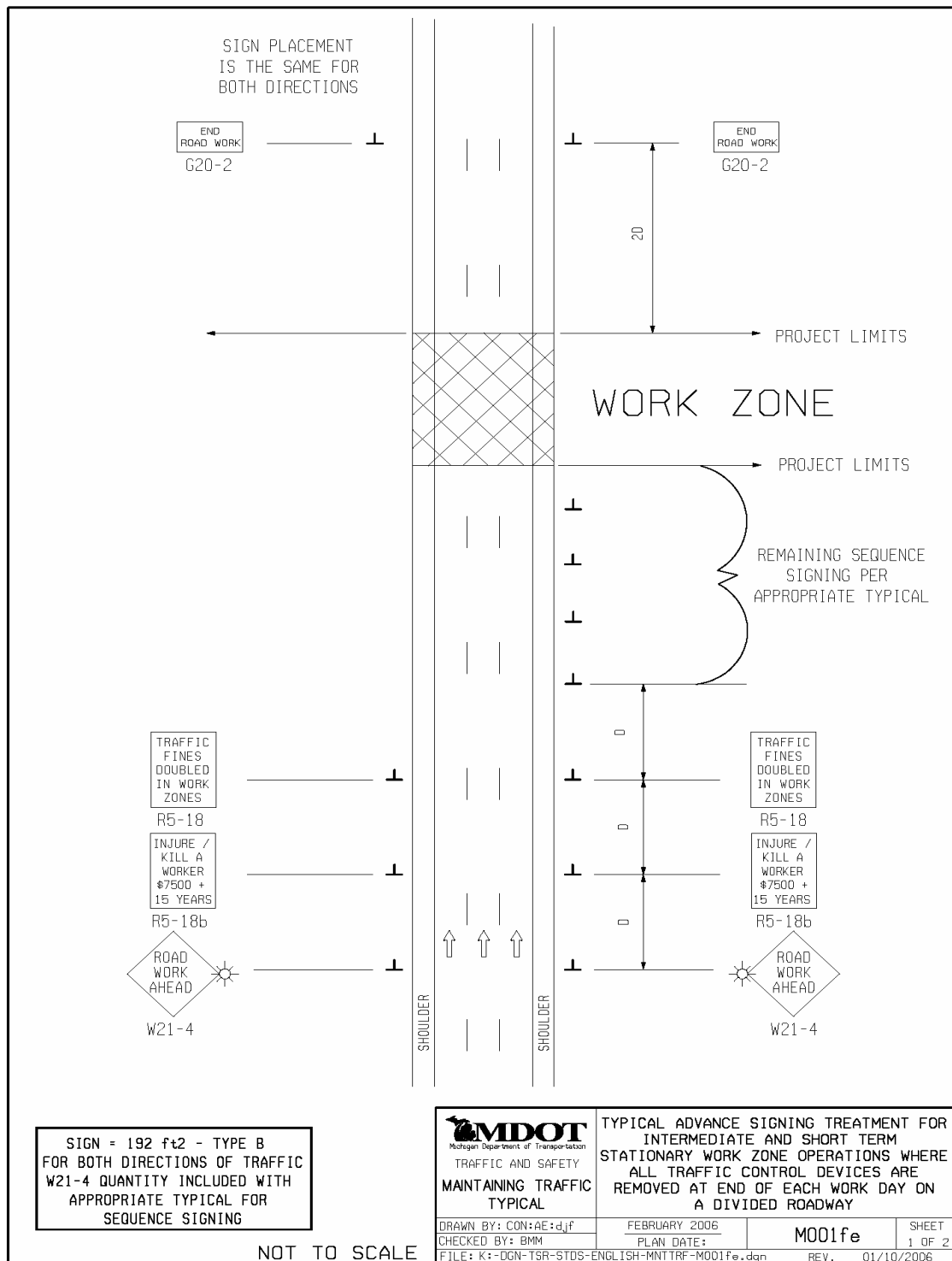
CHECKED BY: BMM

PLAN DATE:

2 OF 2

FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M000e.dgn

REV. 01/30/2006




## NOTES

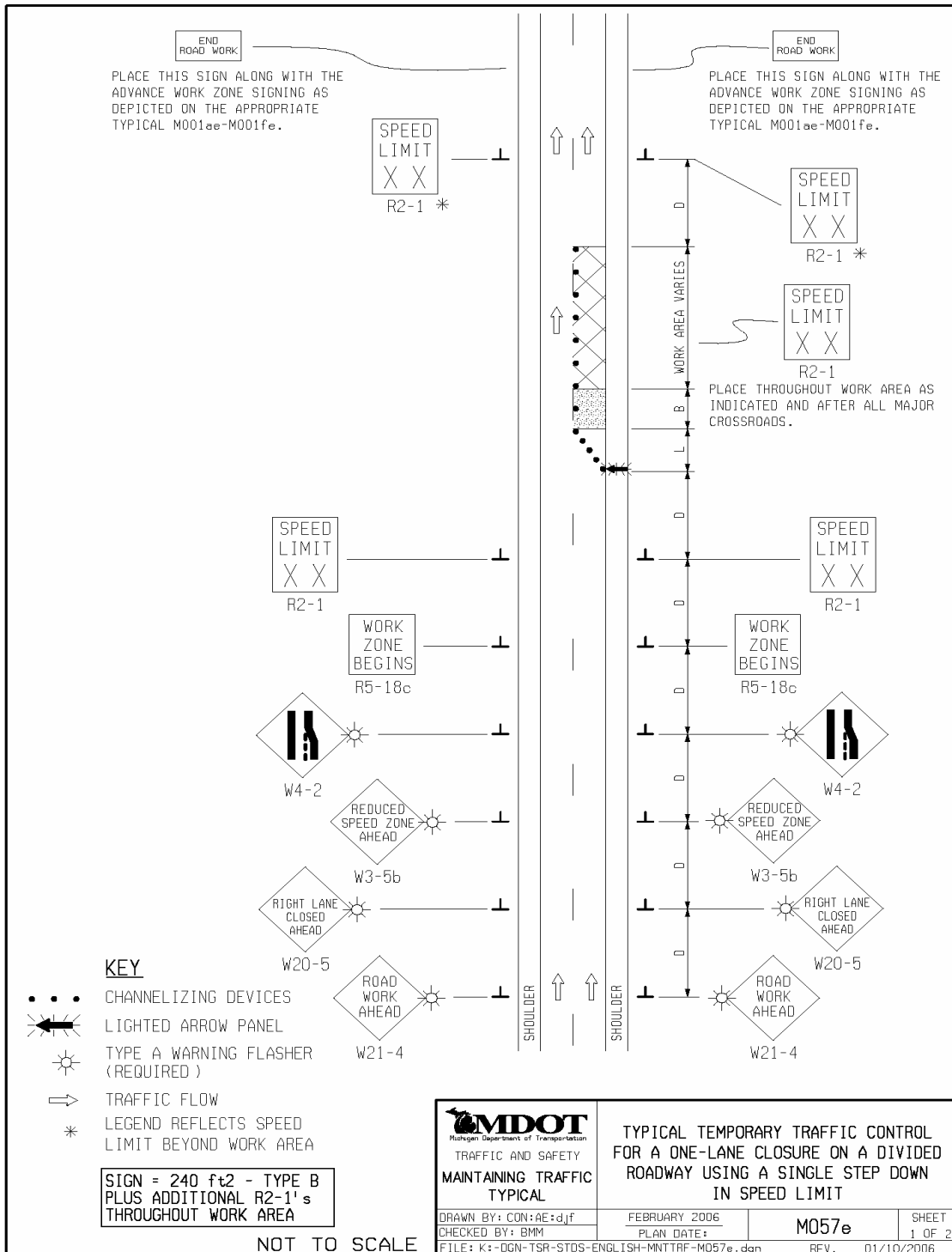
30. THE APPROPRIATE ADVANCE SIGNING SEQUENCE(S), (M001ae THROUGH M001fe) SHALL BE USED ON ALL PROJECTS.
35. THESE SIGNS ARE INTENDED TO BE USED WITHIN THE LIMITS OF THE TEMPORARY SEQUENCE SIGNING AS IS SHOWN ON 1 OF 2. THESE SIGNS ARE NOT TO BE INTERMINGLED WITH ANY OTHER TEMPORARY SEQUENCE SIGNING EXCEPT AS SHOWN.

## SIGN SIZES

G20-2	-	48" x 24"
R5-18	-	48" x 60"
R5-18b	-	48" x 60"
W21-4	-	48" x 48"

NOT TO SCALE

 <b>MDOT</b> <small>Michigan Department of Transportation</small> TRAFFIC AND SAFETY <b>MAINTAINING TRAFFIC</b> <b>TYPICAL</b>		TYPICAL ADVANCE SIGNING TREATMENT FOR INTERMEDIATE AND SHORT TERM STATIONARY WORK ZONE OPERATIONS WHERE ALL TRAFFIC CONTROL DEVICES ARE REMOVED AT END OF EACH WORK DAY ON A DIVIDED ROADWAY	
DRAWN BY: CON:AE:djf	FEBRUARY 2006	<b>M001fe</b>	SHEET
CHECKED BY: BMM	PLAN DATE:		2 OF 2
FILE: K:\-DGN-TSR-STD5-ENGLISH-MNTTRF-M001fe.dgn		REV.	01/10/2006




## NOTES

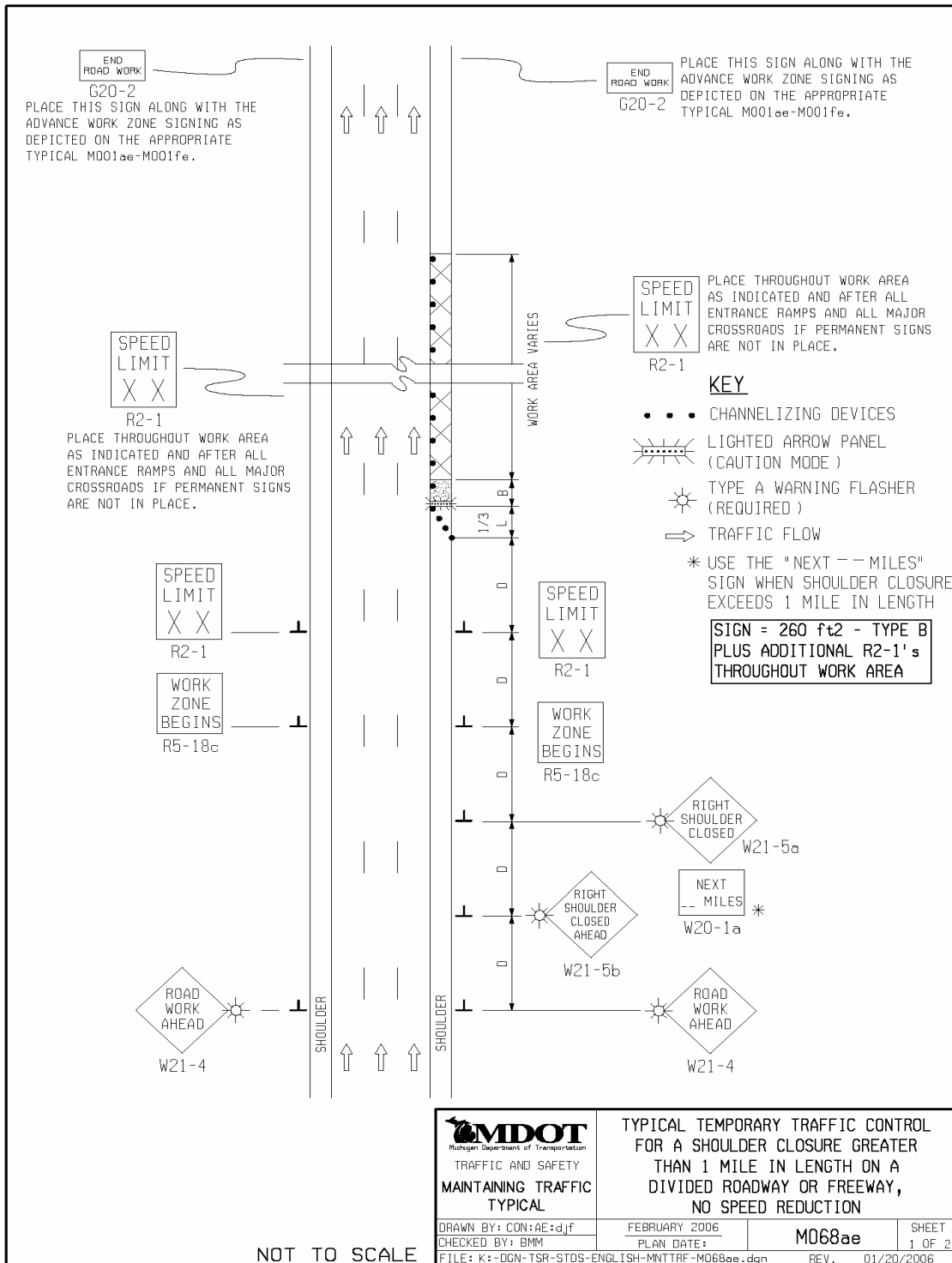
- 1EB. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES  
L = MINIMUM LENGTH OF TAPER  
B = LENGTH OF LONGITUDINAL BUFFER  
SEE **M000e** FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4E. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES SHOULD BE EQUAL IN FEET TO THE POSTED SPEED IN MILES PER HOUR ON TAPER(S) AND TWICE THE POSTED SPEED IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, CHANNELIZING DEVICES SHALL BE LIGHTED PLASTIC DRUMS.
6. THE TYPE A WARNING FLASHER SHOWN ON THE WARNING SIGNS SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE 2005 EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 16B. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED SHALL BE PLACED BEYOND THE LIMITS OF THE REDUCED SPEED AS INDICATED.
- 16E. WHEN EXISTING SPEED LIMITS ARE REDUCED MORE THAN 10 MPH, THE SPEED LIMIT SHALL BE STEPPED DOWN IN NO MORE THAN 10 MPH INCREMENTS.
21. ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS, SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR DAYTIME-ONLY TRAFFIC PATTERNS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.
26. THE LIGHTED ARROW PANEL SHALL BE LOCATED AT THE BEGINNING OF THE TAPER AS SHOWN. WHEN PHYSICAL LIMITATIONS RESTRICT ITS PLACEMENT AS INDICATED, THEN IT SHALL BE PLACED AS CLOSE TO THE BEGINNING OF THE TAPER AS POSSIBLE.

## SIGN SIZES

DIAMOND WARNING - 48" x 48"  
 RECTANGULAR REGULATORY - 48" x 60"  
 R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

 Michigan Department of Transportation TRAFFIC AND SAFETY <b>MAINTAINING TRAFFIC</b> <b>TYPICAL</b>		<b>TYPICAL TEMPORARY TRAFFIC CONTROL</b> <b>FOR A ONE-LANE CLOSURE ON A DIVIDED</b> <b>ROADWAY USING A SINGLE STEP DOWN</b> <b>IN SPEED LIMIT</b>	
DRAWN BY: CON:AE:djt	FEBRUARY 2006	<b>M057e</b>	SHEET 2 OF 2
CHECKED BY: BMM	PLAN DATE:		
FILE: K:\DGN-TSR-STD5-ENGLISH-MNTTRF-M057e.dgn		REV.	01/10/2006




### NOTES

- 1E. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES  
 1/3 L = MINIMUM LENGTH OF TAPER  
 B = LENGTH OF LONGITUDINAL BUFFER  
 SEE **M000e** FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4E. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES SHOULD BE EQUAL IN FEET TO THE POSTED SPEED IN MILES PER HOUR ON TAPER(S) AND TWICE THE POSTED SPEED IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, CHANNELIZING DEVICES SHALL BE LIGHTED PLASTIC DRUMS.
6. THE TYPE A WARNING FLASHER SHOWN ON THE WARNING SIGNS SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE 2005 EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 29A. THE TYPE OF REFLECTIVE SHEETING USED FOR THE W20-1a PLAQUE SHALL BE THE SAME AS THE TYPE USED FOR THE PARENT SIGN.

### SIGN SIZES

DIAMOND WARNING - 48" x 48"  
 W20-1a PLAQUE - 48" x 36"  
 R2-1 REGULATORY - 48" x 60"  
 R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

 Michigan Department of Transportation TRAFFIC AND SAFETY <b>MAINTAINING TRAFFIC TYPICAL</b>		<b>TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE GREATER THAN 1 MILE IN LENGTH ON A DIVIDED ROADWAY OR FREEWAY, NO SPEED REDUCTION</b>	
DRAWN BY: CON:AE:djf	FEBRUARY 2006	<b>M068ae</b>	SHEET
CHECKED BY: BMM	PLAN DATE:		2 OF 2
FILE: K:\DGN-TSR-STD5-ENGLISH-MNTTRF-M068ae.dgn		REV.	01/20/2006

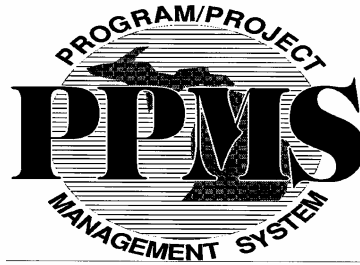
**ATTACHMENT G  
SCOPE OF SERVICES  
CS 80024 - JN 83935C  
EB I-94 from 1.2 miles east of M-40 to 0.6 miles east of Kalamazoo County Line**

**P P/PMS Task Combined Manual**

*ATTACHMENT G*



**PROGRAM/PROJECT MANAGEMENT  
SYSTEM**



**COMBINED  
PRECONSTRUCTION  
PROCESS  
DOCUMENTATION  
MANUAL  
(TASK MANUAL)**

Updated December, 2005

*FIND AT [WWW.MICHIGAN.GOV/MDOT](http://www.michigan.gov/mdot)*

*DOING BUSINESS > DESIGN > BULLETIN BOARD LINKS > PPMS*

